The following listing of claims will replace prior versions, and listings, of claims in the application:

Listing Of Claims:

1. (Original) Apparatus for illuminating an object under test in an interferometer having an optical axis, said apparatus comprising:

at least one source of radiation; and

means for directing radiation from said source at the object from different locations that are distant from the optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within the interferometer.

2. (Previously presented) The illumination apparatus of claim 1 wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

3. (Original) The illumination apparatus of claim 2 wherein said means for directing radiation from said source comprises a diffraction grating mounted for rotation about said optical axis.

4. (Original) The illumination apparatus of claim 2 wherein said means for directing radiation from said source comprises a holographic element mounted for rotation about said optical axis.

5. (Original) The illumination apparatus of claim 2 wherein said means for directing radiation from said source comprises a beam splitter and two prismatic elements coupled, respectively, to two different facets of said beam splitter, said beam splitter and said prismatic elements being mounted for rotation about said optical axis.

6. (Original) The illumination apparatus of claim 2 wherein said means for directing radiation from said source comprises a rotational shearing interferometer.

7. (Original) The illumination apparatus of claim 6 wherein said rotational shearing interferometer comprises a pair of oppositely rotated Dove prisms.

8. (Original) The illumination apparatus of claim 2 wherein said means for directing radiation from said source comprises a disk having a pair of oppositely spaced clear apertures and mounted for rotation about said optical axis.

9. (Previously presented) The illumination apparatus of claim 1 wherein said distant locations from which radiation is directed toward an object are equidistant from said optical axis.

10. (Previously presented) The illumination apparatus of claim 9 wherein said equidistant locations lie in a plane substantially perpendicular to the optical axis.

11. (Previously presented) The illumination apparatus of claim 1 wherein said radiation from each of said locations is directed toward the object at substantially the same time.

12. (Previously presented) The illumination apparatus of claim 1 wherein said radiation from each of said locations is directed toward the object at different times during a predetermined time period.

13. (Original). The illumination apparatus of claim 12 further including a detector having a capture period and wherein said predetermined time period is no more than said capture period of said detector.

14. (Original) The illumination apparatus of claim 1 wherein said source for generating radiation comprises a point source and wherein said radiation directing means comprises an arrangement for rotating said point source around said optical axis at a predetermined rate such that radiation emanating from said point source appears to be originating from said two different locations.

15. (Currently amended) The illumination apparatus of claim 14 wherein said radiation directing means comprises at least one rotating wedge.

16. (Currently amended) The illumination apparatus of claim 14 wherein said radiation directing means comprises a pair of serially arranged rotating wedges.

17. (Currently amended) The illumination apparatus of claim 14 wherein said radiation directing means comprises a beam splitter mounted for rotation in one azimuth and a wedge mounted for rotation in another azimuth.

18. (Currently amended) The illumination apparatus of claim 14 wherein said radiation directing means comprises serially arranged mirrors, one mounted for rotation in azimuth and the other for rotation in elevation.

19. (Previously presented) The illumination apparatus of claim 1 wherein said radiation directing means comprises optical components structured to selectively image said source at different distant locations around said optical axis at different times.

20. (Previously presented) The illumination apparatus of claim 1 wherein said radiation directing means comprises at least one optical component for receiving radiation from said source and forming at least one thin ring of illumination all points of which are distant from said optical axis such that said locations are encompassed by said thin ring.

21. (Original) The illumination apparatus of claim 20 wherein said radiation directing means is structured to selectively vary the distance by which said points are distant from said optical axis.

22. (Previously presented) The illumination apparatus of claim 20 wherein said ring source comprises a multimode fiber of circular cross-section excited by said source so that the emergent modal pattern from the output end of said multimode fiber is in the form of an annular ring.

23. (Previously presented) The illumination apparatus of claim 20 wherein said source comprises a point source and said thin ring source comprises said point source and an axicon.

24. (Previously presented) The illumination apparatus of claim 23 wherein said axicon comprises a diffractive element.

25. (Previously presented) An interferometric apparatus having an optical axis, said interferometric apparatus comprising:

means for locating an object to be measured along the optical axis;

an optical arrangement adapted to at least in part cooperate with an object to form an interferometer and facilitate the generation of interfering wavefronts in which phase information about the object is encoded; and

means for directing radiation onto the object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within said interferometer to generate interfering wavefronts corresponding to each of said locations where each wavefront contains substantially identical phase information about the object from said interferometer.

26. (Previously presented) The interferometric apparatus of claim 25 wherein said different locations comprise as least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

27. (Original) The interferometric apparatus of claim 26 wherein said means for directing radiation from said source comprises a diffraction grating mounted for rotation about said optical axis.

28. (Original) The interferometric apparatus of claim 26 wherein said means for directing radiation from said source comprises a holographic element mounted for rotation about said optical axis.

29. (Original) The interferometric apparatus of claim 26 wherein said means for directing radiation from said source comprises a beam splitter and two prismatic elements coupled, respectively, to two different facets of said beam splitter, said beam splitter and said prismatic elements being mounted for rotation about said optical axis.

30. (Previously presented) The interferometric apparatus of claim 26 wherein said means for directing radiation from said source comprises a rotational shearing interferometer.

31. (Original) The interferometric apparatus of claim 30 wherein said rotational shearing interferometer comprises a pair of oppositely rotated Dove prisms.

32. (Original) The interferometric apparatus of claim 26 wherein said means for directing radiatoin from said source comprises a disk having a pair of oppositely spaced clear apertures and mounted for rotation about said optical axis.

33. (Previously presented) The interferometric apparatus of claim 25 wherein said distant locations from which radiation is directed toward an object are equidistant from said optical axis.

34. (Previously presented) The interferometric apparatus of claim 33 wherein said equidistant locations lie in a plane substantially perpendicular to the optical axis.

35. (Original) The interferometric apparatus of claim 25 further including means for imaging said interfering wavefronts to form an interferogrammetric image in which said phase information about the object contained in each said interfering wavefronts from said interferometer is combined to enhance signal levels while suppressing phase information from sources other than the object that would otherwise be present in said interferogrammetric image as artifacts.

36. (Pr viously presented) The interferometric apparatus of claim 35 further including means for analyzing said interferogrammetric image to determine selected characteristics of the object.

37. (Previously presented) The interferometric apparatus of claim 35 wherein said means for directing radiation onto the object to be measured comprises a point source mounted for movement around said optical axis.

38. (Previously presented) The interferometric apparatus of claim 25 wherein said means for directing radiation onto the object to be measured comprises at least one thin ring source having a nominally constant radius and nominally centered on said optical axis.

39. (Previously presented) The interferometric apparatus of claim 38 wherein said ring source comprises a multimode fiber of circular cross-section excited by a pump source so that the emergent modal pattern from the output end of said multimode fiber is in the form of an annular ring to form said thin ring source.

40. (Previously presented) The interferometric apparatus of claim 38 wherein said thin ring source comprises a point source and an axicon.

41. (Previously presented) The interferometric apparatus of claim 40 wherein said axicon comprises a diffractive element.

42. (Previously presented) The interferometric apparatus of claim 25 wherein said means for directing radiation onto the object to be measured comprises a point source and means for selectively imaging said point source around said optical axis so that it appears to be originating from said different locations distant with respect to said optical axis.

43. (Previously presented) The interferometric apparatus of claim 42 wherein said means for selectively imaging said point source comprises at least one rotating wedge.

44. (Previously presented) The interferometric apparatus of claim 42 wherein said means for selectively imaging said point source comprises a pair of serially arranged rotating wedges.

45. (Previously presented) The interferometric apparatus of claim 42 wherein said means for selectively imaging said point source comprises a beam splitter mounted for rotation in one azimuth and a wedge mounted for rotation in another azimuth.

46. (Previously presented) The interferometric apparatus of claim 42 wherein said means for selectively imaging said point source comprises serially arranged mirrors, one mounted for rotation in azimuth and the other for rotation in elevation.

47. (Previously presented) The interferometric apparatus of claim 35 further including means for facilitating phase shifting interferometric analysis of said selected characteristics of said object.

48. (Previously presented) The interferometric apparatus of claim 25 wherein said means for directing radiation onto the object to be measured is adapted to collimate said radiation.

49. (Previously presented) The interferometric apparatus of claim 35 wherein said means for imaging said optical interferometric beams to form an interferogrammetric image comprises collimating and converging lenses.

50. (Previously presented) The interferometric apparatus of claim 35 further including a detector for receiving said interferogrammetric image to generate an electronic output signal for subsequent analysis, said detector having a given sampling rate.

51. (Previously presented) The interferometric apparatus of claim 50 wherein said interferogrammetric image is formed during a predetermined time period that is no more than the period of said given sampling rate of said detector.

52. (Previously pres nt d) Th int rferometric apparatus of claim 50 wher in said predetermined time period is substantially zero so that the object to be measured receives radiation from said at least two locations substantially simultaneously.

53. (Previously presented) An Illumination method for use with an interferometer having an optical axis, said illumination method comprising the steps of:

generating radiation from at least one source; and

directing radiation from said at least one source toward an object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within the interferometer.

54. (Previously presented) The illumination method of claim 53 wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

55. (Original) The illumination method of claim 54 wherein said radiation from said source is directed by a diffraction grating mounted for rotation about said optical axis.

56. (Original) The illumination method of claim 54 wherein radiation from said source is directed by a holographic element mounted for rotation about said optical axis.

57. (Original) The illumination method of claim 54 wherein said radiation from said source is directed by a beam splitter and two prismatic elements coupled, respectively, to two different facets of said beam splitter, said beam splitter and said prismatic elements being mounted for rotation about said optical axis.

58. (Original) The illumination method of claim 54 wherein said radiation from said source is directed by a rotational shearing interferometer.

59. (Original) The illumination m thod of claim 58 wherein said rotational shearing interferometer comprises a pair of oppositely rotated Dove prisms.

60. (Original) The illumination method of claim 54 wherein said radiation from said source is directed by a disk having a pair of oppositely spaced clear apertures and mounted for rotation about said optical axis.

61. (Previously presented) The illumination method of claim 53 wherein said distant locations from which radiation is directed toward an object are equidistant from said optical axis.

62. (Previously presented) The illumination method of claim 61 wherein said equidistant locations lie in a plane that is substantially perpendicular to the optical axis.

63. (Previously presented) The illumination method of claim 53 wherein said radiation from each of said locations is directed toward an object at substantially the same time.

64. (Previously presented) The illumination method of claim 53 wherein said radiation from each of said locations is directed toward an object at different times during a predetermined time period.

65. (Original) The illumination method of claim 64 further including the step of detecting radiation from the object during a capture period and wherein said predetermined time period is no more than said capture period.

66. (Original) The illumination method of claim 53 further including the step of generating radiation from a point source and directing the radiation from the point source by rotating said point source around said optical axis at a predetermined rate such that radiation emanating from said point source appears to be originating from said two different locations.

67. (Original) The illumination method of claim 53 wherein said radiation is directed by selectively imaging said source at different distant locations around said optical axis at different times.

68. (Original) The illumination method of claim 53 wherein the step of directing radiation comprises receiving radiation from said source and forming at least one thin ring of illumination all points of which are distant from said optical axis such that said two locations are encompassed by said thin ring.

69. (Original) The illumination method of claim 68 further including the step of selectively varying the distance by which said points are distant from said optical axis.

70. (Previously presented) An interferometric method comprising the steps of:

locating an object to be measured along an optical axis;

arranging optical components adapted to at least in part cooperate with an object to form an interferometer and facilitate the generation of interfering wavefronts in which phase information about the object is encoded; and

directing radiation onto the object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within said interferometer to generate interfering wavefronts corresponding to each of said locations where each wavefront contains substantially identical phase information about the object from said interferometer.

71. (Original) The interferometric method of claim 70 further including the step of imaging said interfering wavefronts to form an interferogrammetric image in which said phase information about the object contained in each of said interfering wavefronts from said interferometer is combined to enhance signal levels while suppressing phase information from sources other than the object that would otherwise be present in said interferogrammetric image as artifacts.

72. (Original) The interferometric method of claim 71 further including the step of analyzing said interferogrammetric image to determine selected characteristics of the object.

73. (Previously presented) The interferometric method of claim 70 wherein said different locations comprise at least two that are equidistant from the optical axis,

oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

74. (Original) The interferometric method of claim 73 wherein said radiation from said source is directed by a diffraction grating mounted for rotation about said optical axis.

75. (Original) The interferometric method of claim 73 wherein said radiation from said source is directed by a holographic element mounted for rotation about said optical axis.

76. (Original) The interferometric method of claim 73 wherein said radiation from said source is directed by a beam splitter and two prismatic elements coupled, respectively, to two different facets of said beam splitter, said beam splitter and said prismatic elements being mounted for rotation about said optical axis.

77. (Original) The interferometric method of claim 73 wherein radiation from said source is directed by a rotational shearing interferometer.

78. (Original) The interferometric method of claim 77 wherein said rotational shearing interferometer comprises a pair of oppositely rotated Dove prisms.

79. (Original) The interferometric method of claim 73 wherein said radiation from said source is directed by a disk having a pair of oppositely spaced clear apertures and mounted for rotation about said optical axis.

80. (Original) The interferometric method of claim 70 wherein radiation is directed onto the object to be measured by at least one thin ring source having a nominally constant radius and nominally centered on said optical axis.

81. (Original) The interferometric method of claim 72 further including the st p of introducing phase shifts in said interfering wavefronts and performing phase shifting interferometric analysis to determine said selected characteristics of said object.

82. (Original) The inteferometric method of claim 81 wherein said step of introducing phase shifts into said interfering wavefronts comprises the step of changing the radial position of said two locations.

83. (Original) The interferometric method of claim 71 further including the step of detecting said interferogrammetric image to generate an electronic output signal for subsequent analysis, said detecting step occurring during a given sampling period.

84. (Original) The interferometric method of claim 82 wherein said interferogrammetric image is formed during a time that is no more than said given sampling period.

85. (New) Apparatus for illuminating an object under test in an interferometer having an optical axis, said apparatus comprising:

at least one source of radiation; and

means for directing radiation from said source at the object from different locations that are distant from the optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within the interferometer, wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

86. (New) An interferometric apparatus having an optical axis, said interferometric apparatus comprising:

means for locating an object to be measured along the optical axis;

an optical arrangement adapted to at least in part cooperate with an object to form an interferometer and facilitate the generation of interfering wavefronts in which phase information about the object is encoded; and

means for directing radiation onto the object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially

identical optical path differences within said interferometer to generate interfering wavefronts corresponding to each of said locations where each wavefront contains substantially identical phase information about the object from said interferometer, wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

87. (New) An Illumination method for use with an interferometer having an optical axis, said illumination method comprising the steps of:

generating radiation from at least one source; and

directing radiation from said at least one source toward an object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within the interferometer, wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

88. (New) An interferometric method comprising the steps of:

locating an object to be measured along an optical axis;

arranging optical components adapted to at least in part cooperate with an object to form an interferometer and facilitate the generation of interfering wavefronts in which phase information about the object is encoded; and

directing radiation onto the object to be measured from different locations that are distant from said optical axis such that radiation from said locations is incident to the same points on the object along optical paths having substantially identical optical path differences within said interferometer to generate interfering wavefronts corresponding to each of said locations where each wavefront contains substantially identical phase information about the object from said interferometer, wherein said different locations comprise at least two that are equidistant from the optical axis, oppositely spaced along an azimuth through said optical axis, and wherein radiation therefrom is mutually coherent.

Amendments To The Drawings:

There are no amendments to the drawings.